

Claims

1. A method of lining a materials transfer chute against wear caused by the conveyance of a flowable bulk particulate material in a flowing stream of material through the chute, the method comprising the steps of determining, for the chute, the flow characteristics desired of the flowing stream of material in use, locating, during the design and construction of the chute, a plurality of cascade formations within the chute such that the cascade formations co-operatively define a plurality of cavities that are adapted, in use, to accumulate no more of the material conveyed through the chute than is sufficient to form, in predetermined areas of the chute, a lining of accumulated material upon which conveyed material impinges in moving through the chute and progressively adjusting, during the design and construction of the chute, either or both the shape and size of successive cascade formations along the intended path of conveyance of the flowing stream of material through the chute in dependence on the desired flow characteristics of the flowing stream of material through the chute in use.
2. A method according to claim 1 in which, during the design and construction of the chute, the cascade formations are adapted to form a wear surface in use which wear surface is adapted to modify the vertical and horizontal components of motion of the stream of material in at least part of its passage into, through or out of the chute in dependence on the desired flow characteristics of the flowing stream of material through the chute in use, the method of the invention including the specific steps of locating the cascade formations within the chute such that the cascade formations co-operatively form a wear surface in use, the cascade formations being located to define a plurality of cavities that are adapted, in use, to accumulate no more of the material conveyed through the chute than is sufficient to form, in predetermined areas of the chute, a lining of accumulated material upon which conveyed material impinges in moving through the chute and progressively adjusting, during the design and construction of the chute, either or both the shape and size of successive cascade formations along the intended path of conveyance of the flowing stream of material through the chute to permit the formation of the wear surface in use.
3. A method according to claim 2 in which the step of locating the cascade formations within the chute comprises the specific steps of locating a plurality of trays within the chute, the trays including free edges that project into the chute and face the intended incoming materials flow, a plurality of the trays each being provided with an upstanding

wear lip that extends along the free edge of the tray, the trays and wear lips being adapted to define, co-operatively, dead boxes in which the bulk material may accumulate during material flow through the chute, the method including the steps of dimensioning the trays such that the free edges of the trays are co-extensive with imaginary lines of curvature connecting the free edges of the trays and such that the dead boxes accumulate no more of the material conveyed through the chute than is sufficient to form, in predetermined areas of the chute, a lining of accumulated material upon which conveyed material impinges in moving through the chute (to the extent that no more than parts of the wear lips are exposed to the bulk material flowing through the chute), the trays and the material accumulated therein being adapted, in use, to form a composite dead box, the surface of which is the wear surface that is co-extensive with the imaginary lines of curvature.

4. A method according to any one of the preceding claims in which, during the design and construction of the chute, the chute is separated into one or more of a receiving section, a main chute body and a load-out section, each of which is adapted, singly or in combination, to form a wear surface in use which wear surface is adapted to modify the vertical and horizontal components of motion of the stream of material in at least part of its passage into, through or out of the receiving section, the main chute body and the load-out section.
5. A method according to claim 4 which includes the specific steps, during the design and construction of a chute adapted to deposit the flowing stream of material on a receiving belt, of adapting the load-out section to form a wear surface in use which wear surface is adapted to modify the vertical and horizontal components of motion of the flowing stream of material discharging from the load-out section at least partially to match one or more of the receiving belt travel direction and velocity.
6. A materials transfer chute including a plurality of cascade formations within the chute, the cascade formations co-operatively defining a plurality of cavities that are adapted, in use, to accumulate no more of the material conveyed through the chute than is sufficient to form, in predetermined areas of the chute, a lining of accumulated material upon which conveyed material impinges in moving through the chute, the dimensions of the cascade formations varying progressively to vary either or both the shape and size of successive cascade formations along the intended path of conveyance of the flowing stream of material through the chute in dependence on the desired flow characteristics of the flowing stream of material through the chute in use.

7. A chute according to claim 6 in which the cascade formations are adapted to form a wear surface in use which wear surface is adapted to modify the vertical and horizontal components of motion of the stream of material in at least part of its passage into, through or out of the chute, the cascade formations being located within the chute such that the cascade formations co-operatively define a plurality of cavities that are adapted, in use, to accumulate no more of the material conveyed through the chute than is sufficient to form, in predetermined areas of the chute, a lining of accumulated material upon which conveyed material impinges in moving through the chute, the dimensions of the cascade formations varying progressively to vary either or both the shape and size of successive cascade formations along the intended path of conveyance of the flowing stream of material through the chute in dependence on the desired flow characteristics of the flowing stream of material through the chute in use.
8. A chute according to claim 7 in which the cascade formations are constituted by a plurality of trays within the chute, the trays including free edges that project into the chute and face the intended incoming materials flow, a plurality of the trays each being provided with an upstanding wear lip that extends along the free edge of the tray, the trays and wear lips being adapted to define, co-operatively, dead boxes in which the bulk material may accumulate during material flow through the chute, the trays being dimensioned such that the free edges of the trays are co-extensive with imaginary lines of curvature connecting the free edges of the trays and such that the dead boxes accumulate no more of the material conveyed through the chute than is sufficient to form, in predetermined areas of the chute, a lining of accumulated material upon which conveyed material impinges in moving through the chute (to the extent that no more than parts of the wear lips are exposed to the bulk material flowing through the chute), the trays and the material accumulated therein being adapted, in use, to form a composite dead box, the surface of which is the wear surface that is co-extensive with the imaginary lines of curvature.
9. A chute according to any one of claims 6 to 8 which is separated into one or more of a receiving section, a main chute body and a load-out section, each of which is adapted, singly or in combination, to form a wear surface in use which wear surface is adapted to modify the vertical and horizontal components of motion of the stream of material in at least part of its passage into, through or out of the receiving section, the main chute body and the load-out section.

10. A chute according to claim 9 which is adapted to deposit the flowing stream of material on a receiving belt, the load-out section of the chute being adapted to form a wear surface in use which wear surface is adapted to modify the vertical and horizontal components of motion of the flowing stream of material discharging from the load-out section at least partially to match one or more of the receiving belt travel direction and velocity.